

**MATH 3070 Introduction to Probability and Statistics**  
**Lecture notes**  
**Measures of Position**

**Objectives:**

1. Understand and use the Empirical Rule

**The Empirical Rule (68-95-99.7)**

If the distribution of the data is approximately symmetrical with a single peak we usually refer to this as a **normal distribution**. The distribution is centered around the mean and has noticeable changes in slope at various points related to the standard deviation. We can say this about the data:

1. 68% of the observations fall within 1 standard deviation of the mean.
2. 95% of the observations fall within 2 standard deviations of the mean.
3. 99.7% of the observations fall within 3 standard deviations of the mean.

How can we know this? It depends upon the curve and the characteristics of a symmetrical curve, or density curve. The area underneath the curve is 1 and always positive. The curve bends at each multiple of the standard deviation. These bending points are called inflection points.